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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/720,808 | 11/24/2003 | Kwan-Yeob Chae | SAM-0490 | 5427 |

7590 01/19/2006
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EXAMINER

KING, JUSTIN

ART UNIT PAPER NUMBER

2111

DATE MAILED: 01/19/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|--------------------------------------|--|--|
| Office Action Summary | Application No. 10/720,808 | Applicant(s) CHAE, KWAN-YEOB | |
| | Examiner Justin I. King | Art Unit 2111 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 December 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-4 is/are allowed.
- 6) ☒ Claim(s) 5-8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Allowable Subject Matter

1. Claims 1-4 are allowed.
2. The following is an examiner's statement of reasons for allowance:

Referring to claim 1: The prior arts on record does not explicitly disclose the claimed structure along with the structures of a single common request-reordering unit and a single common grant-reordering unit used for operation of both fixed priority mode and round-robin mode.

Referring to claims 2-4: Claims are allowable because they incorporate the parent claim's allowable subject matter.

3. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Specification

4. The disclosure is objected to because of the following informalities: Applicant has amended the specification to define the acronym "HPRIF" register as "programmable priority register". However, while the acronym "PRI" can be interpreted as priority, the leading "H" and the ending "F" cannot be supported by the alleged definition. Applicant should specify which section of the Specification, as originally presented, supports the alleged meaning of HPRIF. Or

Art Unit: 2111

if the HPRIF is a conventional term for “programmable priority register”, Applicant should state so and provide evidence in the response.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. Claims 5-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sato et al. (U.S. Patent No. 5,583,999) in view of the pointer practice in programming practice taught by “C++ Primer” authored by Stanley Lippman.

Referring to claim 5: Sato discloses a bus arbiter supporting both fixed priority mode and round robin (figure 13, steps 206, 207, and 211 support both fixed priority and round robin). Sato discloses priority-determining units with registers (figure 14), and Sato’s priority-determining units store the priority information in the registers. Sato’s priority-determining units determine the priority of the bus request based on either round robin or linear method (column 1, lines 35-39), the priority-determining units move each bus request’s priority information to the

Art Unit: 2111

next higher level after each time of completing one bus request, and then output the new changed priority information and grant the bus to the request with the highest priority. The function of the priority-determining units' priority updating is equivalent to the claimed rotating unit.

Sato discloses that the priority-determining units prioritize the bus with respect to the individual bus masters (column 1, lines 35-36); such function is equivalent to the claimed request-reordering unit.

Sato's priority-determining units select the request according to the priorities (figure 13, steps 207 and 211); the selecting function is equivalent to the claimed request-selecting unit.

Sato discloses a grant-reordering unit, which outputs the bus grant signal to the bus (figure 13, step 209, figure 14, structure 12).

Sato does not explicitly disclose the practice of a pointer. Lippman discloses that the pointer is a commonly known programming practice. Lippman teaches one to enhance the system performance by managing the allocated objects dynamically rather than statically during execution. Lippman discloses that a pointer holds the value that is the address of an object in memory; thus, an object can be referenced indirectly and dynamically; therefore, the system can reference to any new value by address instead of updating value in a static object.

Hence, it would have been obvious to one having ordinary skill in the computer art to adapt Lippman's teaching onto Sato at the time Applicant made the invention because Lippman teaches one to dynamically manage the data object during execution.

Referring to claim 6: Sato discloses the round robin algorithm (figure 13, step 211); wherein the round robin grants the bus to each request in turn.

Art Unit: 2111

Referring to claim 7: Sato discloses the linear method (figure 13, step 207), which does not change the priority associated with each bus master.

Referring to claim 8: Sato discloses the round robin algorithm (figure 13, step 211); wherein the round robin grants the bus to each request in turn, and moves the priority of the next bus request to the highest. Thus, Sato discloses a period of the periodic change is the time period corresponding to when the bus master grant signal of the highest priority is output.

8. Claims 5-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art in view of the Sato.

Referring to claim 5: The admitted prior art discloses a request-reordering unit, a request-selecting unit, and a grant-reordering unit (figures 1-3). The admitted prior art discloses that the pointer is known practice (figures 2, S220, and figure 3, S310 and S320). The admitted prior art discloses a rotating unit determining the priority (figure 2, S210, figure 3, S310) with registers storing priority information (figure 2, HPRIF), and the practice of pointer information for pointing priority (figure 3, S310). The admitted prior art does not explicitly disclose a combined rotating unit for both fixed priority and round-robin algorithm.

Sato discloses a bus arbiter supporting both fixed priority mode and round robin (figure 13, steps 206, 207, and 211 support both fixed priority and round robin). Sato discloses priority-determining units with registers (figure 14), and Sato's priority-determining units store the priority information in the registers. Sato's priority-determining units determine the priority of the bus request based on either round robin or linear method (column 1, lines 35-39), the priority-determining units move each bus request's priority information to the next higher level

Art Unit: 2111

after each time of completing one bus request, and then output the new changed priority information and grant the bus to the request with the highest priority. The function of the priority-determining units' priority updating is equivalent to the claimed rotating unit.

Hence, it would have been obvious to one having ordinary skill in the computer art at the time Applicant made the invention to adapt Sato's teaching onto the admitted prior art because Sato teaches one to accommodate both the linear method and round-robin algorithm within one arbiter structure (figures 13 and 14) and to reduce the circuit complexity by sharing components between both the linear method and round-robin algorithm.

Referring to claim 6: Both the admitted prior art and Sato disclose the round robin algorithm (figure 13, step 211); wherein the round robin grants the bus to each request in turn.

Referring to claim 7: Both the admitted prior art and Sato disclose the linear method (figure 13, step 207), which does not change the priority associated with each bus master.

Referring to claim 8: Both the admitted prior art and Sato disclose the round robin algorithm (figure 13, step 211); wherein the round robin grants the bus to each request in turn, and moves the priority of the next bus request to the highest. Thus, the admitted prior art and Sato disclose a period of the periodic change is the time period corresponding to when the bus master grant signal of the highest priority is output.

Response to Arguments

9. In response to Applicant's argument that since Sato does not disclose the practice of pointer, Sato fails to teach or suggest an arbiter that includes a rotating unit (Remark, page 10, 1st paragraph, page 14, 2nd paragraph): Sato's priority-determining units determine the priority of

Art Unit: 2111

the bus request based on either round robin or linear method (column 1, lines 35-39), the priority-determining units move each bus request's priority information to the next higher level after each time of completing one bus request, and then output the new changed priority information and grant the bus to the request with the highest priority. The function of the priority-determining units' priority updating is equivalent to the claimed rotating unit. Thus, while Sato does not explicitly disclose the implementation with pointers, Sato does disclose the rotating unit.

10. In response to Applicant's argument that Lippman does not disclose or teach the rotating unit (Remark, page 11, 1st and 2nd paragraphs, page 12): Lippman teaches the well-known practice of pointer in implementing system protocol. Sato discloses the rotating unit as discussed above.

11. In response to Applicant's argument that the admitted prior art fails to disclose or teach a rotating unit (Remark, page 13, 2nd paragraph, page 14, 2nd paragraph): Sato discloses the rotating unit as discussed above, and the admitted prior art is combined with Sato in rejecting the claims.

12. In response to Applicant argument that the admitted prior art leads to the limitations described in the Specification (Remark, page 13, lines 5-8): The language of the claimed limitations is not drafted with limitations to preclude the limitations argued by the Applicants.

Conclusion

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

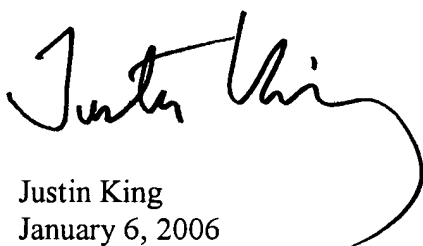
14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Justin I. King whose telephone number is 571-272-3628. The examiner can normally be reached on Monday through Friday, 9:00 am to 5:00 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rehana Perveen can be reached on 571-272-3676 or on the central telephone number, (571) 272-2100. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

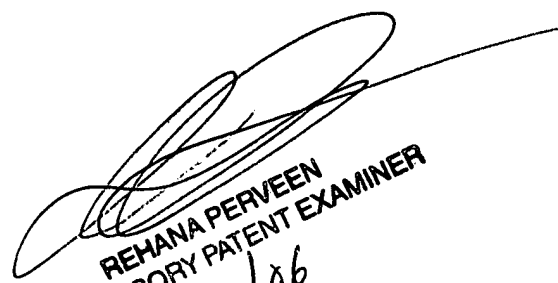
Art Unit: 2111

applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Lastly, paper copies of cited U.S. patents and U.S. patent application publications will cease to be mailed to applicants with Office actions as of June 2004. Paper copies of foreign patents and non-patent literature will continue to be included with office actions. These cited U.S. patents and patent application publications are available for download via the Office's PAIR. As an alternate source, all U.S. patents and patent application publications are available on the USPTO web site (www.uspto.gov), from the Office of Public Records and from commercial sources. Applicants are referred to the Electronic Business Center (EBC) at <http://www.uspto.gov/ebc/index.html> or 1-866-217-9197 for information on this policy. Requests to restart a period for response due to a missing U.S. patent or patent application publications will not be granted.



Justin King
January 6, 2006



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SUPERVISORY PATENT EXAMINER
1/17/06